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# West Europe Report

SCIENCE AND TECHNOLOGY

No. 127



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22 November 1982

# WEST EUROPE REPORT

## SCIENCE AND TECHNOLOGY

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### CONTENTS

#### ELECTRONICS

- Report Submitted on Status of Microelectronics  
(FRANKFURTER ZEITUNG/BLICK DURCH DIE WIRTSCHAFT, 12 Oct 82) 1

#### ENERGY

- Netherlands Energy Research Programs Reviewed  
(ENERGY SPECTRUM, Jul-Aug 82) ..... 3

- Briefs  
    Synthesis Gas 7

#### INDUSTRIAL TECHNOLOGY

- 'MFL' Formed, Part of Machine Tool Industry Restructuring  
(Lubka Stephane; LES ECHOS, 3 Sep 82) ..... 8

#### SCIENCE POLICY

- France Favors Transfer of Certain Technologies to Asia  
(AFP SCIENCES, 5 Aug 82) ..... 10

- Draft Budget for 1983 Gives Priority to Research, Industry  
(ELECTRONIQUE ACTUALITES, 3 Sep 82) ..... 12

- Research, Industry Budget Up 35.8 Percent for 1983  
(Maurice Arvonny; LE MONDE, 17 Sep 82) ..... 14

- Government Seeks More Research-Industry Technology Transfer  
(FRANKFURTER ALLGEMEINE ZEITUNG, 19 Oct 82) ..... 18

- French, Greek Scientific Cooperation To Increase  
(AFP SCIENCES, 5 Aug 82) ..... 20

## TRANSPORTATION

Paris Auto Show Mirrors Worldwide Competition (Henry Lauret; LE MATIN, 30 Sep 82) .....	22
Renault 'VESTA' Experimental Vehicle Exhibited at Show (Jacques Moran; L'HUMANITE, 30 Sep 82) .....	25
Briefs Alfa-Nissan Auto	27

## ELECTRONICS

### REPORT SUBMITTED ON STATUS OF MICROELECTRONICS

Frankfurt/Main FRANKFURTER ZEITUNG/BLICK DURCH DIE WIRTSCHAFT in German 12 Oct 82  
p 5

[Text] One day before its breakup, the FDP (Free Democratic Party) transmitted to the German Parliament a report concerning the status of microelectronics in the Federal Republic of Germany (Parliamentary Document 9/1988). Previous funding of microelectronics by the government likewise will not be significantly changed in the foreseeable future by the new federal government. It aims towards enhancing the performance capability of the

component industry for development of highly integrated components and systems and close collaboration with research institutes and

small and medium businesses, including software and system houses, in the application of microelectronics.

Early availability of new process technologies is one of the most important pre-conditions for the fabrication of highly integrated components. According to the government's view, the semiconductor manufacturers in the Federal Republic occupy a technologically leading role here within the European microelectronics industry. Thus, several businesses have started up new production lines which correspond to the most recent state of the art for the production of semiconductor, memories, and microprocessors. Other businesses have specialized on component markets such as entertainment or watch electronics and are there also showing an excellent performance according to international standards.

This high-performance level in technology, however, is not correspondingly reflected in terms of market fractions. The total sales of German industry, in the area of integrated circuits, makes up only a portion of the sales of individual leading American manufacturers.

As a result, the production of electronic components in the Federal Republic of Germany has in recent years stagnated and sometimes even declined. Imports have also stagnated in the last 2 years. In the area of integrated circuits, production did continue to rise. In parallel to this, imports rose likewise. It is interesting that the number of employees in the electronic component sectors has declined in recent years in the Federal Republic of Germany, and specifically by 10.8 percent from 1975 to 1981.

Economic Development in the Area of Electronic Components and Integrated Circuits  
in the Federal Republic of Germany  
Expenditures in Millions DM

Purpose	1975	1979	1980	1981
1. Electronic components				
Production	3,363	4,238	4,372	4,189
Export	2,012	3,412	3,762	3,879
Import	1,980	3,714	4,508	4,552
Employees	71,490	65,140	65,290	63,750
2. Integrated circuits				
Production	300	450	415	432
Export	279	599	869	948
Import	422	1,095	1,694	1,821

In the view of the Federal Government, as far as power components are concerned, the Federal Republic of Germany in the meantime occupies a peak position internationally. Excellent promotional results were also achieved in the special areas of sensors, the link between the physical environment and information processing. But the problem is market conquest. To accelerate introduction into the market, the special program for microelectronics has been in existence for some time. It is being implemented from 1982 to 1984. It is primarily intended to facilitate access for small and medium businesses. The government funding sums are here handled in accord with a simple procedure.

Because of heavy request, this special program was increased from 300 million DM to 450 million DM. In the meantime, there are more than 2,300 applications from about 1,400 businesses which, according to all expectations, will already exhaust available means. More than two-thirds of the applicants are companies with fewer than 200 employees. About one-half of the applications are product innovations in measurement and control technology.

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CSO: 3698/41

## ENERGY

### NETHERLANDS ENERGY RESEARCH PROGRAMS REVIEWED

Anstelveen ENERGY SPECTRUM in Dutch Jul-Aug 82 pp 174-179

[Excerpts] Electrical Energy. The NOW [National Wind-Energy Research] program, initiated in 1976, was completed in early 1981 with the submission of an evaluation report in which the ECN [Center for Energy Studies] gathered the results of the various component activities commissioned by the BEOP [Office of Energy Research Projects]. The NOW goal of attaining quantitative insights into the possible contribution of wind energy to the national energy supply was not fully reached, but the conclusions reached in the report did prompt the government to commission a follow-up program. This National Wind-Energy Development Program: NOW-II aims to promote local uses of small wind turbines and the development of central electrical generation in parks with large wind turbines.

The activities of the ECN in the area of wind energy are directed to contributions to NOW and extend over the total field from local applications to central generation. They comprise by far the greatest portion of the ECN program Electrical Energy. The activities in the field of solar energy in the year under review were limited to supporting BOEP and project designs for the heating of swimming pools.

In regard to the main lines of the National Solar Energy Research Program [NOZ], a number of interesting conclusions can be drawn. Thus, solar heating of swimming pools no longer needs to be a concern of NSERP. For there are presently on the market installations that are fairly efficient economically. Moreover, the technical and economic demonstration of these systems is coordinated in the first instance by the Common Market. And the decision has been made to give much greater attention in the solar boiler program to large-scale technical demonstrations. For this, budget shifts have been introduced that make it possible for the NOZ not only to finance the research aspects, but also to help provide funds for the installations. At this time, there are 12 projects with a total of 15 to 30 installations in the residential housing sector in progress or preparation. There is a pleasing new development that could lead to a solar boiler system of synthetic material whose market costs are almost half of those of the present-day system. A prototype is now being tested.

At the end of the year under review, the government declared its position relative to the recommendation of the Planning Commission Program for the National Coal Research Program NOK. In anticipation of the government position, the OERP,

on the basis of the Planning Commission report and in touch with initiatives in the research world, formulated a number of program proposals which were submitted in September to the appropriate ministries. These proposals addressed approximately 50 projects with a total cost of over 60 million guilders, spread over the following categories: coal cleaning, safety, AFBC, PFBC [expansions unknown], burner development, fluegas desulfurizing plaster and coal residues.

Lastly, the contribution of national research on energy storage in flywheels to the Electrical Energy program is considered. For this, ECN has already developed a prototype motor/generator for stationary flywheel application. There are plans to test several flywheels developed by Fokker and TNO from synthetic material in a special installation in preparation for the final testing of the motor/generator system.

On 29 June 1981, the minister of economic affairs placed in operation at ECN the 300 kW horizontal axis turbine with a rotor diameter of 25 m (25 m HAT). The evaluation of this installation, designed and built by FDO in cooperation with other participants, has led to modifications in various system components. The operation management and administration of the pilot program through ECN are presently part of NOW. The control specifications and the pilot research were done by a team under the direction of ECN in which FDO, TH-Delft and TH-Eindhoven participate. In the safety evaluation of the 25 m HAT, experience with methods from nuclear technology were useful. For making the safety recommendation, estimates were made of the personal and collective risks in the case of blade breakage. These activities have laid the groundwork for a general evaluation of the benefit of wind turbines under normal and abnormal circumstances.

The NOW plans for the coming year, among other things, the construction of an initial experimental wind power plant. In consultation with KEMA [Office for the Inspection of Electrotechnical Material], therefore, the ECN continued during the year under review the development of statistical methods for research on the applicability of wind power to the production of electricity. The results attained thus far by ECN suggest that considerable wind power can be used without using costly storage systems such as reservoir basins of the so-called Lieveense plan.

The testing of small wind turbines at the ECN test station near Petten is concerned with the characteristics of electrical generation, the benefit of the drift mechanism, the calculation of rpm's, the tower and sail load and the elasticity of the blade stems. In 1981, two wind turbines were tested--for possible assignment to test projects.

An essential step in the introduction of wind energy for local applications is the development of technical regulations for the construction and operation of the turbines. For this purpose, BOEP formed a task force called Wind-Turbine Regulations. Under the secretaryship of ECN, this group has representation from the Work Inspection, Ministry of Public Health and Environmental Hygiene, the Union of Dutch Municipalities, KEMA, NLR [National Aeronautical and Astronautical Research Institute] and TNO [Netherlands Central Organization for Applied Natural Scientific Research]. Several new international activities were



initiated in which ECN has been involved. ECN has taken the initiative to begin cooperation with foreign test stations for wind turbines. ECN has also been designated to represent the Netherlands in several areas of a Common Market wind energy program.

#### Office of Energy Research Projects

In 1981 great progress was made in the five national research programs that are administered by the Office of Energy Research Projects mainly for the Ministry of Economic Affairs. This has become an exacting and growing task. Here, the BOEP is more and more playing the role of an important clearinghouse on the many problems of using alternative energy sources. On 18 May and 1 October, there were conferences on the wind and solar energy programs, respectively, held in Utrecht where reports were made on the status of the projects.

After conferring with the Ministry of Economic Affairs, it was decided to publish a periodical newsletter to meet the need for information about the programs of wind and solar energy. Publication has meanwhile begun. In the usual way, OERP maintained numerous foreign contacts in its field. New contacts were made with Greece, where there is interest in Dutch-developed knowledge and technology for possible uses of wind energy, especially on the numerous Greek islands. This could perhaps create opportunities for Dutch industry for supply contracts.

The first phase of the flywheel program has shown that the best potential uses are in the transportation sector. Along with this, thought has been given to their use in small wind turbines to hold the voltage constant for electricity generated at variable wind speed. Concrete study proposals for use in municipal buses and local trains await the approval of the Ministry of Economic Affairs.

In 1981, there were 24 contracts written, amounting to a total of 26 million guilders, while, at the end of 1981, there were 59 contracts in preparation for a total of more than 45 million guilders. The National Wind Energy Research Program [NOW-1] was formally completed 1 March 1981. The results of the 5-year research and development project are stated in the evaluation report "Perspectives for Wind Energy in the Netherlands." The conclusions and recommendations of the report can be summarized as follows:

--In terms of diversification strategy, wind energy offers sufficient prospects to encourage its application strongly.

--Before it can be safely introduced on a large scale, a great number of problems must first be solved.

--A follow-up program would help eliminate these problems.

--The results of the NWRP show that it is feasible to institute a national strategy stressing the use of wind as a source of energy.

Tangible results of the NOW are:

--The 25 m HAT, placed in operation in June 1981. After the usual lead-in problems, the execution of the actual pilot program was able to get underway in December 1981.

--Implementation of a test situation for small windmills.

--Preparation and partial implementation of around ten test projects for local application of wind energy.

At the request of the Wind Energy Supervisory Commission, and acting on these conclusions and recommendations, the Office of Energy Research Projects has formulated a program of continuation [NOW-II] for the purpose of promoting the careful introduction of central and local use of the wind as an energy source in energy programs of the Netherlands to the end that by the year 2000 there will have been installed at least: 1,000 large units in wind power plants (1,500 to 2,000 MW total power) and 15,000 smaller windmills (450 MW total power).

This 9-year program, subdivided into three phases of three years each, was submitted to the minister of economic affairs for his approval on 25 June 1981. The minister instructed the OERP on 11 December 1981 to execute the first phase of the program. Some important ancillary projects are the design and construction of a large (more than 1 MW) wind turbine with horizontal axis and the preparation for the installation of a small electrical power plant operating on wind. Early in 1981, it was decided to extend the study phase (Phase I) of Dutch research in the area of magneto-hydrodynamic energy conversion (MHD), an advanced system for increasing the efficiency of electric power plants using fossil fuels. On the basis of several sub-studies, various industries have made proposals for research projects in Phase II of the MHD project. Among other things, these call for testing out a MHD burner and developing a generator design. Together with the Steering Committee of the Dutch MHD Project, OERP took the first steps by drawing up a proposal for a program for this second phase.

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## ENERGY

### BRIEFS

SYNTHESIS GAS--KHD Humboldt Wedag (FRG) has developed a self-heating process for production of synthesis gas of high heating power from any type of coal. The gas produced contains only carbon monoxide and hydrogen that are practically free of carbon dioxide and sulfur compounds, so that in many cases it can be used directly without the necessity of further purification. A typical gas generator consumes 10 tons of coal per hour and works at 10 bars and 1,300-1,400 °C, with production of 20,000 m<sup>3</sup> of gas per hour. The process is based on the dissolution of coal in molten iron contained in the gas generator and on the reaction of the coal itself with the gases that are blown into the molten mass. The gas generator is built of refractory material, and the finely pulverized coal is blown into the molten mass, together with lime and oxygen, from a series of nozzles. Oxygen (or air) and steam are blown from another series of nozzles. The gasification process takes place between the coal and gas present, while the molten iron serves as catalyzer and reaction medium and is not consumed. The gas is freed from the dust by means of a centrifugal separator, and the nongasifiable components (the coal ash and the lime, which serves as a scorifier) are eliminated from the reactor continuously in the molten state. The first applications are expected to go into operation by the end of 1982. [Text] [Rome RASSEGNA PETROLIFERA in Italian 16 Jul 82 p 665] 11267

CSO: 3698/27

## INDUSTRIAL TECHNOLOGY

### "MFL" FORMED, PART OF MACHINE TOOL INDUSTRY RESTRUCTURING

Paris LES ECHOS in French 3 Sep 82 p 6

[Article by Lubka Stephane: "Machine Tools: Official Birth of the French Heavy Machine Company (MFL)"]

[Text] Stockholders and Government to Provide a Billion [francs].

An apparently successful delivery after months of laborious gestation: this morning at the IDI [Industrial Development Institute] headquarters, was born the French Heavy Machinery Company, the cornerstone of the reorganization of the machine tool industry which will make it possible to bring to close the precarious books on Line, formerly number two in the industry. The Institute holds 35 percent of the capital (250 million francs) in the new company of which the other stockholders are, each collecting 7.2 percent interest: Alsthom-Atlantique, Schneider SA, Dassault, Peugeot, Renault, Sacilor, SNIAS [National Aerospace Industrial Company], SNECMA [National Company for the Study and Construction of Airplane Motors] and Usinor.

The identity of these firms is worth emphasizing knowing that they all use heavy machines and that the problems of the machine tool industry could, at least partially, be solved by reconquering the domestic market. Hence

Hence this commentary from Louis Tardy, boss of Line, named president of the board of directors of French Heavy Machines: "The composition of the stockholders is important because it is not a matter of a purely financial operation but the grouping of companies representing approximately 70 percent of heavy machinery consumption in France. It is not by a pseudotechnical protectionism that a competitive industry making modern production systems will be reconstructed," he adds. "There must be a symbiosis between the study and design offices of the users and the development and marketing offices of the MFL."

### Loss of Jobs

That said, the MFL, a holding company, will acquire two industrial subsidiaries with a capital of 100 million francs before the end of the month:

1. For heavy turning: regrouping of Berthier (SNECMA subsidiary) and Saint-Etienne Machine-Outil (bought by Line from Ernault-Somau) as Berthier-Saint Etienne. That company will develop on the Saint-Etienne site only, with the Berthier facilities at Givors being eliminated.

2. For heavy milling: regrouping of TMI Forest at Capdenac (Lot) and Line SA at Albert (Somme) under the corporate name Forest-Line. In this case both sites are being retained.

From a social standpoint, these two operations will result in the elimination of a certain number of jobs (in the first case, 370 out of a total of 1,070 and, in the second case, 270 out of a total of 880), which will be resolved in principle by early retirement departures and reclassifications as well as by the conversion of two facilities at Albert.

One of these will receive a large facility of the ADEPA (Agency for the Development of Automated Production), the other (AMO [Aviation Marine Tooling]) will be taken over, as planned, by the Baburek group and specialize in "retro-filling." Thus Berthier-Saint Etienne and Forest-Line will begin without some of their work force and previous production tools. Recovery and productivity require that. And considerable financing means will be devoted to them.

In fact, the sums to be devoted by the stockholders and the government, including the subsidies required for personnel reclassification, are estimated at a billion francs. As for investments, there is talk of a plan for adding 200 million francs to a corresponding program over a period of 5 years up to the equivalent of 8 percent of gross sales, which currently comes to 600 million francs for the entire group.

The only thing to be added is a wish that, at this price, the heavy machine industry succeeds and, particularly, that orders--essential first of all for survival and, then, for development of this industry--flow in.

9969

CSO: 3102/458

## SCIENCE POLICY

### FRANCE FAVORS TRANSFER OF CERTAIN TECHNOLOGIES TO ASIA

Paris AFP SCIENCES in French 5 Aug 82 pp 6-7

[Text] Beijing--France is prepared to transfer technologies to China, excluding, however, those which could be of an "offensive" military nature, it was learned yesterday in the entourage accompanying the chief of French diplomacy, who arrived in Peking on 30 July for a six-day visit.

At a press conference held in Beijing on 2 August, the French minister of external relations, Mr Claude Cheysson, and his Chinese counterpart, Mr Huang Hua, emphasized the desire of both their countries to intensify their technological cooperation.

"China," declared Mr Huang, "looks forward to an intensifying of its economic cooperation with the countries of Europe and of the West in general, and with France in particular, in specific domains."

Mr Cheysson, for his part, expressed the view that the memorandum of agreement signed previously by Beijing with regard to the construction by France of nuclear power plants in China (see AFP SCIENCES No. 233 of 23 October, pp 3 and 22) must be "adjusted" to the austerity policy of the People's Republic.

He indicated that a French mission will be coming to China within the next few weeks to discuss Beijing's intentions with respect to nuclear-generated electric power and to set forth France's offering in that domain.

On 5 August, Mr Cheysson is expected to arrive in Seoul where, according to French sources in the South Korean capital, he intends to assure the South Korean leaders of the French government's desire to extend bilateral cooperation with Seoul to all domains, particularly from the economic standpoint.

France, it is recalled, recently obtained a large contract to furnish South Korea two nuclear power plants (see AFP SCIENCES No. 257 of 9 April 1981, p 24).

Seoul will be the second stage of Mr. Cheysson's official trip, after Beijing. Upon completion of his visit to Seoul, the French minister will depart for New Delhi (see AFP SCIENCES pp 26, 27 of the present issue) for an official visit to India before returning to Paris. The supplying of slightly enriched uranium is high on the agenda of the talks to be held in India by the chief of French diplomacy, according to a reliable source.

A communique from the Ministry of Foreign Trade, released on 4 August in Paris, states that the French technical mission responsible for studying the terms and conditions of a possible participation by France in the construction of a Chinese nuclear power plant "could arrive in Beijing on 19 August."

The communique states that this mission, which is to be headed by Mr. Noel Chahid-Nourai, principal private secretary of the minister of foreign trade, will travel to Beijing and Canton to negotiate with the Chinese regional and central authorities "the industrial and financial terms and conditions relative to French participation in the construction of the first Chinese nuclear power plant, which could be built in association with the Hong Kong authorities in the province of Guandong."

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## SCIENCE POLICY

### DRAFT BUDGET FOR 1983 GIVES PRIORITY TO RESEARCH, INDUSTRY

Paris ELECTRONIQUE ACTUALITES in French 3 Sep 82 p 6

[Article: "Budget 1983: Priority to Research and Industry."]

[Text] The governmental budget draft for 1983 reflects a priority for research and industry. One notes that the electronics industry is, for the first time, given a total budget of 1.8 billion francs. The funds accorded to research will increase by 17.8 percent in volume and to industry by 23.7 percent in value. Military expenditures are increasing by 10 percent, or less rapidly than in 1982. For the rest, several measures will be taken in favor of employment, and training and education, while special actions will be carried out in favor of energy conservation.

Research: Up 17.8 Percent

The objective of bringing the national research effort up to 2.5 percent of the GNP in 1985 led the government to increase the civilian research budget by 17.8 percent in volume and 28 percent in value, or 32,526 million francs in 1983.

Funding accorded to the development of the electronics and data processing industry has tripled and goes from 640 million in 1982 to 1.8 billion in 1983. If this latter figure is compared to the 140 billion, required by the electronics industry over 5 years, or 28 billion a year, one perceives the importance of this industry from a financial standpoint, even if, as concerns the electronics industry, this budget has to be supplemented by PTT [Postal, Telegraph, Telephone Company] funds, passed in an additional budget, and by investments from public and private firms.

Funding of 500 million capital is planned for CII HB [Data Processing Company-Honeywell-Bull]. The funds planned for the development of aeronautical programs increase from 2.1 to 2.8 billion (up 33 percent). Funding devoted to the space program (development of Ariane, Spot) increase by 24.5 percent (2.3 billion francs in program authorizations). The increase of funding for the development of solar energy is 30 percent (363 million francs in 1983), and the electronuclear program is being continued. The development of biotechnologies is being strongly encouraged.



Industry: Up 23 Percent

The Economic and Social Development Fund (FDES) is not eliminated but its package is reduced to 1 billion francs. Aid to industry will increase by 23 percent, which corresponds to a sixfold increase in funding since 1981. The nationalized sector will receive most of its aid in the form of capital increase (11 billion francs, 7.5 billion of which is for the competitive sector). This aid is to undergo a procedural simplification.

National Defense: Up 17 Percent

National defense funding is being increased by only 10 percent compared to 17 percent in 1982, or 3.9 percent of the GNP. The great priorities remain unchallenged, specifically strategic armament (the nuclear package is up 24.6 percent).

Funding for employment is increasing by 31 percent and should create 1,500 new jobs in research and industry. An effort is also being made in technical training.

In measures taken to promote long term savings, it is planned that a portion of the savings of the French people will be used to finance industry.

9969

CSO: 3102/458

## SCIENCE POLICY

RESEARCH, INDUSTRY BUDGET UP 35.8 PERCENT FOR 1983

Paris LE MONDE in French 17 Sep 82 p 12

[Article by Maurice Arvonny]

[Text] Jean-Pierre Chevenement, the minister of research and industry, and Edmond Herve, the ministerial delegate for energy, presented the draft budget for the ministry of research and industry and the draft civilian research budget, which combines the research spending of all the ministries (spending by the ministry of research and industry makes up 3/4 of this total).

The total figures show some significant growth, much greater than the increases for all of the draft civilian state budgets combined, which is 13.3 percent in value, or 4.9 percent in volume. The civilian research budget is to increase from 25.4 to 32.5 billion francs--with 25.3 billion going to the ministry of research and industry's budget. This is a 28 percent increase.

The other funding--industry and energy--will have a less steep increase, going from 9.4 to 10.9 billion (up 16 percent). If we include 7.3 billion in capital invested in public enterprises--of which 0.5 billion is already included in the research budget--and 2 billion produced by parafiscal fees and the special hydrocarbons fund, we find that the total amount will rise from 38.45 to 52.2 billion francs, a 35.8 percent rise in value (25.7 percent in volume). Even if lumping these figures together in this way may be questionable, it does show a clear priority being given to research, technological development, industrial reorganization, and control of energy. This priority is in agreement with the options which the chief of state has announced on a number of occasions.

In 1982 the civilian research budget came to a total of 25.4 billion francs, equally divided between ordinary spending and program allocations. The category of ordinary spending, which essentially covers salaries, is to reach 15.2 billion in 1983 (up 19.7 percent). Program allocations will increase even more sharply (36.6 percent) and should come to a total of 17.3 billion in 1983 (see LE MONDE of 31 July).

In accordance with the technological research and development orientation and programming law, the draft budget is split into four categories: mobilizing programs, basic research, applied and finalized research, and technological development programs, to which should be added non-allocated indirect resources. In the allocation among these categories we can read France's scientific policy. There is a very strong increase in funding for the seven mobilizing programs\*, for which funding will increase from 5.3 billion to 8.6 billion francs. This rate of increase is 62 percent. It is partly caused by the appearance of two new items, a capital investment of 0.5 billion for CII-Honeywell-Bull, and a "joint charge" of 1.02 billion for the future La Villette museum. But even if we deduct this money, there remains a 34 percent increase which shows how much emphasis is being placed on the mobilizing programs.

The other categories will grow less rapidly: basic research will have its funding increased from 6.3 to 7.8 billion (up 24 percent). funding for finalized research will increase from 3.7 to 4.5 billion (up 22 percent). Four technological development programs\*\* will receive 8.1 billion, compared with 6.6 billion in 1982 (up 23 percent). Indirect funding will increase from 5.1 to 5.5 billion (up 8 percent).

This concentration on seven programs will produce a great disparity in funding for the various research organizations. For example, the INRA's [French National Institute of Agronomic Research] funding will only increase by 15 percent, and that of the CNRS [National Center for Scientific Research] by 16.6 percent, while the CNES [National Space Studies Center] will have

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\* Rational use of energy and energy diversification, expansion of biotechnologies, electronics, research and innovation for the Third World, employment and working conditions, promotion of French and dissemination of scientific knowledge, technological development of the industrial fabric.

\*\* Nuclear-generated electricity, space, civil aviation, oceans.

a 27.6 percent funding increase. Resources of the ministry (primarily research funds) will increase by 27.6 percent. The ANVAR [National Agency for the Valorization of Research] will have its funding increased by 19.7 percent.

The law calls for the civilian research budget to increase in volume by an annual average rate of 17.8 percent. In the 1983 budget, this rate is reached, and even slightly exceeded. Another figure stipulated in this law is an average annual increase in staffing levels of 4.5 percent. The draft budget contains 2,462 new jobs (696 scientists and 1,766 engineers, technicians, and administrative personnel), of which 962 are contract personnel whose status is being regularized. The growth rate here is only 4.3 percent.

The rate of 4.5 percent has not been reached in this budget, but the law sets this rate only as an annual average over a 3-year period. At any rate, the number of jobs created is much higher than the first discussions led us to expect. Some concern was expressed during the national colloquium on research and technology about the capacity of our educational system to train the necessary scientists and technicians. On this issue, Mr Chevenement said that as he has kept the commitments to enlarge the budget which he had made, he expects the research personnel to carry out fully the missions which the law assigns to them, that is, training, the dissemination of information, and the valorization of results, in addition to research in the strict sense of the term.

The "industry and energy" aspect of the budget comes to a total of 12.7 billion francs--of which 1.8 billion has already been included in the civilian research budget, which leaves a balance of 10.9 billion francs. In order to determine the cost of the entire industrial policy, we should add 7.3 billion francs in capital investments in national companies. This figure includes 0.5 billion for research for CII-Honeywell-Bull.

The 10.9 billion francs include 3.1 billion in funds for industrial interventions. This is up 39 percent from 1982. The essential part of this increase is due to the strong rise (more than doubling) of the funds allocated to electronics--1.35 billion francs compared with 0.64 billion the previous year. These funds also include 160 million francs for the activities of qualification, standardization, metrology, safety, etc. 25 new jobs are being created in the field of nuclear safety.

For energy and raw materials, we find a reduction from 1.43 billion to 1.17 billion francs in funds allocated to the Energy Control Agency. The justification is that this agency will receive 2 billion francs from the special fund for major projects, which is to be distributed during the 1982 and 1983 fiscal years.

A large part of this is the subsidy granted for France's national coal production, which is increasing by 26 percent. Amounting to 6.5 billion, this is half of the industrial interventions fund, which comes to a total of 13.1 billion, and includes some funds such as ANVAR funds which are included in the research part of the budget. Mr Chevenement also gave some information on the tax credit for businesses which are involved in research, pointing out the inadequate number of such companies--less than 2,000. A fourth of the difference in the volume of research spending between the 2 consecutive years may be attributed to the income tax or the business tax. The minister expects that this measure will produce 4,000 or 5,000 companies doing research by 1985.

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## SCIENCE POLICY

### GOVERNMENT SEEKS MORE RESEARCH-INDUSTRY TECHNOLOGY TRANSFER

Frankfurt/Main FRANKFURTER ALLGEMEINE ZEITUNG in German 19 Oct 82 p 4

[Text] Bonn, 18 Oct--After the shock of the cost explosion in connection with the two large reactor projects, the new Federal Research Minister Riesenhuber is pondering new possibilities for promoting research or innovation, which will cost little or no money, and in the long term could even make a little profit. Besides indirect (tax) promotion of industrial research and development, which is to be expanded at the cost of the direct funding of about 6,000 individual projects--an old concern of the two current coalition parties--it is technology transfer from science to application from which Riesenhuber is hoping for an impulse in the direction of technical and scientific development. In part, he can here fall back on a set of tools that has already been created during the previous years. But research policy will in the future stress more strongly than before the autonomous cooperation between research and industry as well as market forces; the government should create the framework conditions for this, for example by eliminating bureaucratic obstacles, and by helping to stimulate the conversion of research results into inventions. At a symposium of the Federal Ministry for Research and Technology, on the topic of "Technology Transfer From Research Institutions" in the scientific center in Bonn, showed how important this topic will be in the future for the research policy of the federal government, where there are opportunities but also where there are obstacles.

The central position was occupied by the 12 major research institutions. It was Riesenhuber's criticism that they had not sufficiently fulfilled their function as a bridge between basic research and industry. The government funded them with copious means, but the resulting know-how and the resulting effect on the market were not satisfactory. The major research institutions should be more strongly guided by this objective, to use their research results in an economic sense. However, the self-image of scientists is not the least obstacle to this, according to which they still perceive themselves as "far in advance of industrial application." The major research institutions do not regard technology transfer as their main task: In the future, too, they want to concentrate on a few major programs and do not wish to diversify--so said the chairman of the Working Community of major research institutions, Gisbert zu Putlitz. However, even in the research institutions, market-oriented thinking should not be rejected as irrelevant, but should be recognized as a boundary condition of research. As a stimulus for the scientists, the research minister announced a prize of 30,000 DM. This was to distinguish top performance in technology transfer.

Although the major research institutions are slow to change their course--there are considerable thresholds to pass on the other side too. The member of the board of Siemens AG, who is responsible for research, namely Mr. Beckurts, talked about "Contact Phobias." For medium industry, Hartmut Scheller, Kleindienst GmbH, Augsburg, pointed to the large communication difficulties between research and business: Not technology transfer but a transfer of understanding supposedly is necessary. Beckurts urged that the research institutions organize open-house days, especially for interested parties from industry. However, on the part of industry, there also must be readiness to develop new technologies, even outside their own laboratories, with the aid of the government research potential. As an important means for transferring knowledge and skills from science to industry, a job change of employees between the two areas was mentioned. However, obstacles involving administration, salaries, and fringe benefits stand against such a move. At this time, the Research Ministry is examining the idea of establishing a fund for industry, by means of which highly qualified scientists can be brought into the major research institutions or can be maintained there; regardless of the business, this fund should make possible payment beyond the government salary ordinance.

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## SCIENCE POLICY

### FRENCH, GREEK SCIENTIFIC COOPERATION TO INCREASE

Paris AFP SCIENCES in French 5 Aug 82 p 1

[Text] Athens--France and Greece will be developing their cooperation in the field of scientific research, particularly in the domains of new energies, biotechnologies, electronics and the humanities and social sciences.

In a joint statement published in Athens on 31 July at the conclusion of the official visit there by the French minister of research and industry, Messrs Jean-Pierre Chevenement and Georges Lianis, the Greek minister of research and technology, expressed the desire that this cooperation be intensified through an exchange of researchers and technical specialists and through the training of mixed research teams.

This cooperation is to carry over into specific projects, notably geothermal, wind-power and solar-energy ones. Mr Chevenement indicated that a mission from the French Agency for the Harnessing of Energy will be arriving soon at the Aghia Roumeli Solar Energy Plant in Crete.

France and Greece also want to carry out multilateral research projects on a European and Mediterranean scale. Within the EEC [European Economic Community] framework, a project of Greek origin has been put to study, having as its object applied research and technology in the domain of alternate sources of energy.

The day before, Mr Chevenement, who had been in Greece since 29 July, took part in a round-table discussion at the Greek National Research Institute.

The return to economic growth, he stressed during that discussion, must come about through scientific research and technological innovation. He pointed out that, in 1982, France's domestic expenditure on research has represented around 2.2 percent of its gross domestic product, putting France on an equal footing with Japan and the FRG [Federal Republic of Germany] in this domain. This is France's highest rate since 1967 (also 2.2 percent), Mr Chevenement remarked.

France's new research policy, he added, is a "highly voluntaristic" one, made possible by the existence of a strong economic public sector, and--



one oriented toward intensified solidarity with its EEC partners and with the developing countries. "No research worthy of the name is possible," Mr Chevenement said at another point in the discussion, "unless it is sparked by freedom." France has chosen the difficult road of socialism within a framework of freedom midway between multinational capitalism and bureaucratic communism."

During his official visit to Greece, Mr Chevenement visited the Greek nuclear power plant "Democritos" at Athens, and the Greek Pasteur Institute, where he inaugurated an ultracentrifuge which is to be used in virological research.

The minister, who was accompanied by Messrs Jean-Francois Poly and Raymond Dedonder, respectively president of the INRA [French Institute for Agronomical Research] and director of the Pasteur Institute, also met with Prime Minister Andreas Papandreou, with whom he discussed, in particular, President Francois Mitterrand's forthcoming visit to Greece (around the beginning of September).

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## TRANSPORTATION

### PARIS AUTO SHOW MIRRORS WORLDWIDE COMPETITION

Paris LE MATIN in French 30 Sep 82 p 17

[Article by Henry Lauret]

[Text] The Paris auto show opens today at 1300. This exhibit, which is held in Paris every 2 years, will be officially inaugurated tomorrow by President Mitterrand. A big crowd is expected at the Porte de Versailles, where automobile manufacturers from all over the world are showing off their latest developments.

The real issues are hidden behind the show's facade. Today the automobile industry is still resisting the economic crisis which is disrupting the world. But the markets are no longer expanding in most of the regions concerned. Bernard Hanon said yesterday that all hypotheses used show that a threshold has been reached in western Europe: the automobile by itself accounts for 13 percent of household consumption. In the United States, this figure is 14 percent. This means that it is a significant expense for the customer, who is becoming more and more sensitive to the level of operating costs. In 1961 it cost a metallurgical worker 1,750 hours of work to buy a car. In 1982, it costs 890 hours. But this trend is certainly leveling off now.

Henceforth, the battle of the automobile industry will be fought more than in the past in the areas of technical development, innovation, and competitiveness. The head of Renault, speaking of this yesterday, told the press of the fundamental objectives he has set to take up the challenge of competition (see LE MATIN of 29 September). Starting in 1983, Renault each year will introduce a new model and a new plant--that is, it will either adapt its existing plants or will establish new ones in order to achieve levels of productivity equivalent to those in its Douai (R 9) plant--and a new foreign market. Last year, the new foreign market was Portugal. This year, Renault is introducing

its Alliance in the United States and Canada (its goal is sales of 100,000 cars a year). "The worldwide dimension is the only dimension for the automobile industry," says Bernard Hanon, who rejects any protectionist maneuvers between the European auto manufacturers, and who feels that cooperation agreements between different makes have limits built in by the concept of competition.

At a time when there is talk of a reduction in production cycles, of the development of standardized platforms for different models, of "onboard" electronics, of plastic transmission systems, of robotics or automated production, etc., the automobile industry can no longer afford to simply meander along.

#### The Big World Battle is at Its Height

There is a recession in Europe, and a depression in America. The automobile industry obeys the major laws of the worldwide economy, even if there are exceptions which serve to prove the rule. And France, as we know, is one of these exceptions. Against all expectations, auto registrations this year should exceed the number in 1981 by nearly 10 percent. Who can tell why? That's just the way it is.

Taken all together, worldwide production is down this year. The giants in Detroit, General Motors, Ford, and Chrysler, are reorganizing to fit a North American market which has dropped from over 9 million vehicles a year to a rate close to 6 million. And in addition, the Japanese, who last year led the world in production, are no longer expanding in this market because an implicit quota has been set on Japanese imports.

So, while the big--and the not so big--companies are now showing off their latest developments at the Paris auto show, there can be no doubt that offstage, the big world battle is at its height. After saturating the U.S. market, the Japanese seem to be observing a slowdown in Europe. But let there be no mistake about it. This is certainly just a period of consolidation in preparation for a new offensive.

GM and Ford have not been wasting any time. GM, number one in the world, has invested billions of dollars in Spain, setting up a production capacity for 270,000 cars a year, destined essentially for West Europe. The little Corsas are made there in excellent productivity conditions. Ford, whose Cologne plant also has an excellent productivity record, is bringing out its Sierra against the 7/9 CV of Renault, PSA, and Volkswagen.

In a world in which surplus production capacity is growing, there is no way out without an adjustment of competitiveness, starting from the top down. Fiat, which recovered its health by laying off some 30,000 workers in Turin, which it was able to do without political damage, is now in a good position. Particularly as the exchange rate of the Italian lira does give it a certain monetary advantage. British Leyland, which in just a few years had dropped to 18th place in the world, is trying to survive through the ironfisted leadership of its president, Michael Edwards. And also through cooperation agreements with Honda of Japan.

While Mercedes and BMW are remaining outside these agreements for the time being, and Volvo, taking advantage of its own special appeal, is doing extremely well after succeeding in a spectacular diversification into oil, Volkswagen/Audi is recovering. In Brazil, where VW dominates the market, the company is once again making money. But the German company will have to revise its strategy in the United States, where it was too quick to think that the historic success of its Beetle could be repeated with the Rabbit. VW learned an expensive lesson there.

In the midst of this international concert, Renault and PSA have had different fortunes. Renault, for a price tag of \$370 million (\$1 = 4.30 francs, fortunately), bought the American Motors facilities in Kenosha; a rather decrepit network of 1,300 distributors, but with a total sales potential of 100,000 vehicles in America. The future will tell whether or not the Alliance, the American version of the R9, will change Renault's bad luck in the United States.

But Renault will not stop its expansion abroad there. It is essential to move forward, Bernard Hanon, the head of Renault, told LE MATIN yesterday. PSA is obviously counting on its new Citroen BX.

It is time for Peugeot to bring out new models demonstrating some new life in the company. The 205 is scheduled for the spring of 1983. Until then, Peugeot/Talbot will rely on its policy of design changes in the existing line. The "digestion" process here has been a difficult one, and it is not over yet. Citroen was and remains a healthy company, and a car with a good reputation.

The Peugeot/Talbot partnership is, to say the least, rather unequal. But if Peugeot had not bought out Chrysler's European subsidiaries, what wouldn't have been said if these assets had been taken over by the competition? Everything has its price, even defensive actions.

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## TRANSPORTATION

### RENAULT 'VESTA' EXPERIMENTAL VEHICLE EXHIBITED AT SHOW

Paris L'HUMANITE in French 30 Sep 82 p 12

[Article by Jacques Moran]

[Text] One experimental vehicle follows another. After Peugeot's VERA series, Renault yesterday introduced its second prototype, the VESTA [Advanced System and Technology Fuel-Efficient Vehicle] at the preview of the Paris auto show. The VESTA represents a new generation of fuel-efficient cars. EVE was designed on the basis of an R18. The VESTA is a distant relative of the R5. According to Renault, "the design of this prototype is based on our intention to develop a product with wide public appeal in the 1990s."

The VESTA consumes no more than 3 liters per 100 km. It can carry four people and offers a level of performance, comfort, and safety that is at least equal equivalent to today's cars, says Renault. The vehicle has a CX [Air Penetration Coefficient] of 0.22, which is a remarkable performance for a small car. It uses a good many light materials which have given it a 30 percent weight savings over the R5.

The VESTA has front-wheel drive with a transversally-mounted engine, but Renault has made only the first tests with a gasoline engine. The fuel consumption is: 2.28 liters at 90 km/hour, 3.64 liters at 120 km/hour, and 3.04 liters for city driving. The average consumption amounts to 2.99 liters.

The VESTA will not be completely ready until the end of the year, and the major work left to be done will concentrate on lightening the vehicle, which might weigh as little as 520 kilos, almost 2 times less than a standard R5. More detailed studies on the engine might further lower fuel consumption. The length of the vehicle is 3.20 meters.



Peugeot, with its "VERA plus," and Renault with the VESTA have now developed a car which consumes less than 3 liters, the goal set for 1985 by the government. The first assembly-line models derived from these prototypes might be ready before 1990, and we do know that Peugeot has already used several technical solutions used in the first VERA prototypes. Might the VESTA be ready by 1985 to prefigure the new generation of the R5?

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## TRANSPORTATION

### BRIEFS

ALFA-NISSAN AUTO--Date of introduction of Alfa-Nissan cars confirmed: At the conclusion of a meeting between the president of the Fund for the Mezzogiorno, Massimo Perotti, and a delegation from Alfa-Nissan led by the company's president, Corrado Innocenti, and its vice president, Massimo Takeiahi, it was confirmed that the Italian-Japanese firm's first cars will come out of the Piano-dardine (Avellino) plant in July 1983. The factory, installed on an area of 208,000 m<sup>3</sup>, will employ 1,042 persons full-time. The cost of the fixed investments has been estimated at Lit 62.2 billion; the Fund for the Mezzogiorno has participated in the enterprise in the amount of Lit 38 billion, and will also provide Lit 17 billion in financing for construction of the firm's infrastructures. [Text] [Turin ATA-INGEGNERIA AUTOMOTORISTICA in Italian Jun 82 p 474] 11267

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